[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 27 and 29

[Docket No. ; Notice No.]

RIN:

Harmonization of Miscellaneous Rotorcraft Regulations

AGENCY: Federal Aviation Administration, DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: This notice proposes changes to the type certification requirements for normal and transport category rotorcraft. The changes would amend the airworthiness standards to require a cockpit indication of autopilot operating mode to the pilots for certain autopilot configurations, to clarify the burn test requirements for electrical wiring for transport category rotorcraft, and to provide a new requirement for an electrical wire burn test for normal category rotorcraft. The proposed rule would also add a 1.33 fitting factor structural strength requirement to the attachment of litters and berths. The proposed changes to 14 CFR parts 27 and 29 (parts 27 and 29) are harmonized with the European Joint Aviation Requirements (JAR) 27 and 29.

DATES: Comments must be received on or before [insert date 90 days after date of publication in the Federal Register].

ADDRESSES: Submit comments in triplicate to the Federal Aviation Administration (FAA), Office of the Chief Counsel, Attention: Rules Docket (AGC-200), Docket No. ; Room 915G, 800 Independence Avenue SW, Washington, DC 20591. Comments submitted must be marked Docket No. . Comments may also be sent electronically to the following internet address: nprmcmts@mail.hq.faa.gov. Comments may be examined in Room 915G weekdays between 8:30 a.m. and 5:00 p.m., except on Federal holidays.

FOR FURTHER INFORMATION CONTACT: Mr. Carroll Wright, Regulations Group, ASW-111, Rotorcraft Directorate, Aircraft Certification Service, FAA, Fort Worth, Texas 76193-0111, telephone (817) 222-5120.

SUPPLEMENTARY INFORMATION:

Comments Invited

Interested persons are invited to participate in the making of the proposed rule by submitting such written data, views, or arguments as they may desire. Comments relating to the environmental, energy, federalism, or economic impact that might result from adopting the proposals in this notice are also invited. Substantive comments should be accompanied by cost estimates. Comments must identify the regulatory docket or notice number and be submitted in triplicate to the Rules Docket at the address specified under the caption "ADDRESSES."

All comments received, as well as a report summarizing each substantive public contact with FAA personnel on this rulemaking, will be filed in the docket. The docket is available for public inspection before and after the comment closing date.

All comments received on or before the closing date will be considered before taking action on this proposal. Late-filed comments will be considered to the extent practicable. The proposals contained in this notice may be changed in light of the comments received.

Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this notice must include a preaddressed, stamped postcard on which the following statement is made: "Comments to Docket No. ." The postcard will be date stamped and mailed to the commenter.

Availability of NPRM's

Using a modem and suitable communications software, an electronic copy of this document may be downloaded from the FAA regulations section of the Fedworld

electronic bulletin board service (telephone: 703-321-3339), the Federal Register's electronic bulletin board service (telephone: 202-512-1661), or the FAA's Aviation Rulemaking Advisory Committee Bulletin Board service (telephone: 202-267-5948).

Internet users may reach the FAA's web page at http://www.faa.gov or the Federal Register's webpage at http://www.access.gpo.gov/su_docs for access to recently published rulemaking documents.

Any person may obtain a copy of this NPRM by submitting a request to the FAA, Office of Rulemaking, ARM-1, 800 Independence Avenue, SW, Washington, DC 20591, or by calling (202) 267-9680. Communications must identify the notice number of this NPRM.

Persons interested in being placed on a mailing list for future NPRM's should request from the above office a copy of Advisory Circular No. 11-2A, NPRM Distribution System, that describes the application procedure.

Background

The FAA has established an Aviation Rulemaking Advisory Committee (ARAC). By a notice in the Federal Register (60 FR 4221, January 20, 1995), the FAA announced the establishment of the Harmonization of Miscellaneous Rotorcraft Regulations Working Group. The Working Group was tasked to recommend to ARAC new or revised requirements for pilot indication of autopilot operating mode; burn test for electrical wire; seats, berths, and litters; and other rotorcraft issues.

Specifically, the working group received the following tasks:

1. Review §§ 27.1329 and 29.1329 and supporting policy and guidance material for the purpose of determining the course of action to be taken for rulemaking and/or policy relative to the issue of requiring pilot indication of autopilot operating mode similar to parts 23 and 25 requirements.

2. Review parts 27 and 29 to determine if clarification is needed for the burn test requirements for transport category and whether a new requirement for burn test for electrical wire for normal category rotorcraft is needed. Consider whether § 29.1351(d)(3) should be deleted and if new §§ 27.1365(c) and 29.1359(c) should be created to specify electrical wire insulation burn test requirements.

3. Review §§ 27.785(f)(2) and 29.785(f)(2) to determine if these sections should be revised to specify whether the 1.33 fitting factor for seats should also apply to berths and litters.

4. Review and make recommendations regarding the disharmonizations introduced by the new Rotorcraft 30 Second/2 Minute One-Engine Inoperative Power Ratings (OEI) (59 FR 47764; September 16, 1994) and the Crash Resistant Fuel Systems (CRFS) in Normal and Transport Category Rotorcraft (59 FR 50380; October 3, 1994) final rules.

The working group included representatives from four major rotorcraft manufacturers (normal and transport) and representatives from Aerospace Industries Association of America, Inc. (AIA), Association Europeene des Constructeurs de Material Aerospatial (AECMA), Helicopter Association International (HAI), the European Joint Aviation Authorities (JAA), and the FAA Rotorcraft Directorate. This broad participation is consistent with FAA policy to involve all known interested parties as early as practicable in the rulemaking process.

The working group presented its findings to the ARAC, which recommended to the FAA that certain miscellaneous changes be made to the airworthiness standards for both parts 27 and 29.

The FAA has evaluated and accepted the ARAC recommendations and proposes the changes contained in this notice.

General Discussion of the Proposals

The following changes are proposed to the airworthiness standards for normal and transport category rotorcraft:

Sections 27.625 and 29.625 Fitting Factors

A new paragraph (d) would be added to §§ 27.625 and 29.625 to require that the 1.33 fitting factor, specified in §§ 27.785 and 29.785 for the attachment of seats also applies to the attachment for litters and berths. The 1.33 fitting factor is necessary to ensure that fittings subject to wear and tear under normal use and subject to frequent removal and replacement in the aircraft will retain adequate strength to perform their intended function under crash landing conditions. The need for this factor for seat attachments and associated harnesses has been substantiated by service experience and is recognized in 14 CFR parts 23, 25, 27, and 29 and in the equivalent JAR. Also, the need for the 1.33 factor for the attachment of litters, berths, and associated harnesses is included in parts 23 and 25 and JAR 23 and 25 but is not currently included in parts 27 and 29 or JAR 27 and 29. This proposed change would provide the same level of safety for passengers in litters and berths as in seats and would harmonize the fitting factor requirement of parts 23, 25, 27, 29 and the JAR.

Sections 27.785 and 29.785 Seats, berths, litters, safety belts, and harnesses

Since the requirements for litters and berths are specified in §§ 27.785(k) and 29.785(k), a new sentence to paragraph (k)(2) is proposed to clarify the requirement for applying the 1.33 fitting factor. This proposed revision would clarify that the 1.33 fitting factor for the attachment of seats specified in proposed §§ 27.625(d) and 29.625(d) also applies to the attachment of litters and berths.

Sections 27.975 and 29.975 Fuel tank vents

This proposed revision would remove the phrase "unless a rollover is shown to be extremely remote" from §§ 27.975(b) and 29.975(a)(7). The JAA states that the phrase

"unless a rollover is shown to be extremely remote" results in weakening the desired requirement, so that a postcrash fire could occur on an aircraft not equipped with rollover protection. The FAA agrees that the intent of this rule is to prevent postcrash fires due to rollover and concludes that the subject phrase does not contribute to the desired result. Also, this proposed revision would resolve a difference between parts 27 and 29 and JAR 27 and 29 introduced by the CRFS rule.

Sections 27.1329 and 29.1329 Automatic pilot system

A new paragraph (f) would be added to §§ 27.1329 and 29.1329 to require display of the autopilot mode to the pilots. Current parts 23 and 25 require that "If the automatic pilot system can be coupled to airborne navigation equipment, means must be provided to indicate to the flight crew the current mode of operation. Selector switch position is not acceptable as a means of indication." Airplane accidents occurred prior to adoption of the requirement of the display of the autopilot mode in parts 23 and 25 due to the pilot not being aware of the current autopilot mode. This type of accident could occur in rotorcraft. Safety will be enhanced by requiring that the autopilot mode be displayed to the pilots of rotorcraft. This would harmonize parts 27 and 29 with the corresponding JAR.

Section 27.1365 Electric cables

A new paragraph (c) to § 27.1365 is proposed that would add a burn test to require self-extinguishing insulation on electrical wire and cable installed in normal category rotorcraft. Most European and U.S. rotorcraft manufacturers currently use electrical wire that meets the proposed burn test requirements. This proposal would require that compliant wire be used.

Section 29.923 Rotor drive system and control mechanism tests

The proposed revision to § 29.923(a) would add the words, "and (p)," after the words "paragraphs (b) through (n)." The "and p" was inadvertently omitted in the OEI

final rule, Amendment 29-35. This change is proposed to correct the oversight and to harmonize part 29 with the JAR requirement.

Section 29.1351 General

The proposal would delete the burn test requirements of § 29.1351(d)(1)(iii) and remove the reference to § 25.1359(d). Section 25.1359(d) was removed from part 25 by Amendment 25-72 (55 FR 29756; July 20, 1990). The proposal would move the electrical wire burn test requirements to a new § 29.1359(c) and cite the correct reference, part 25, Appendix F, Part I(a)(3). The proposed change is administrative and will not alter the current requirements.

Section 29.1359 Electrical system fire and smoke protection

As discussed in the previous paragraph, new § 29.1359(c) would contain the electrical wire burn test requirements. The proposal would add paragraph (c) to this section to place the requirement under a more appropriate heading. The proposed change is administrative and will not alter the current requirements.

Paperwork Reduction Act

There are no requirements for information collection associated with this proposed rule that would require approval under the Paperwork Reduction Act of 1980 (Pub. L. 96-511).

Regulatory Evaluation Summary

Proposed changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 directs that each Federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980 requires agencies to analyze the economic impact of regulatory changes on small entities. Third, the Office of Management and Budget directs agencies to assess the effects of regulatory changes on international trade. In conducting these analyses, the

FAA has determined that this proposed rule: (1) would generate benefits that justify its costs and is not a "significant regulatory action" as defined in the Executive Order; (2) is not "significant" as defined in DOT's Regulatory Policies and Procedures; (3) would not have a significant impact on a substantial number of small entities; and (4) would lessen restraints on international trade. These analyses, available in the docket, are summarized below.

Economic Evaluation

Overall, the proposed changes would result in net cost savings by promoting harmonization between the U.S. regulations and the JAR and by eliminating unnecessary duplication of certification requirements. The costs and benefits of the changes regarding the fitting factor for the attachment of berths and litters, removal of the phrase "unless a rollover is shown to be extremely remote" (in §§ 27.975(b) and 29.975(a)(7)), autopilot operating mode, and burn test for electrical wire in normal category rotorcraft, are summarized below. All other revisions involve clarification or administrative changes.

The fitting factor requirement would not impose incremental costs on most rotorcraft manufacturers. One small manufacturer of part 27 rotorcraft indicated additional nonrecurring testing and analysis costs of $2,000 to substantiate the 1.33 factor in an initial new type certification; most likely, this additional cost would not be incurred in subsequent type certifications. Although there have been no identifiable accidents involving litters attributable to insufficient attachment strength, even one minor injury would far exceed the relatively low costs. Codification of the 1.33 fitting factor, which is inherent in most current designs, would ensure that all future designs include this standard, increasing the minimum level of safety.

There would be no incremental costs or benefits associated with removal of the phrase "unless a rollover is shown to be extremely remote" in §§ 27.975(b) and

29.975(a)(7) since rotorcraft currently meet the minimum fuel spillage requirements under roll-over conditions.

The autopilot display requirement would impose no or insignificant incremental costs on rotorcraft manufacturers since new autopilot systems employed in rotorcraft are similar to those in airplanes and the mode indicator is typically integral to such systems. Codification of this requirement would ensure that all future rotorcraft designs comply with this standard.

Most U.S. and European manufacturers currently use electrical wire that meets the burn test requirements for transport category rotorcraft since they produce both parts 27 and 29 rotorcraft. However, the few manufacturers that produce normal category rotorcraft only would likely experience additional costs. One manufacturer estimates additional nonrecurring testing/design costs at $5,000 per type certification and additional wiring costs of $500 per rotorcraft. At an estimated production of seven rotorcraft per year, the incremental recurring costs would total $3,500 per year for 10 years, or $35,000 total (nondiscounted 1995 dollars), under one type certification. Another manufacturer estimates additional wiring costs of approximately $350 per rotorcraft and no additional nonrecurring costs. At an estimated production of 20 rotorcraft per year, the incremental recurring costs would total $7,000 per year for 10 years, or $70,000 total (nondiscounted 1995 dollars), under one type certification.

There have been several accidents (and more numerous Service Difficulty Reports) related directly or indirectly to shorted or burned-through electrical wiring; i.e., the insulation offered insufficient protection. Examination of National Transportation Safety Board accident and incident data for the period 1983 through 1995 indicates one accident (in June 1994) caused primarily by a short in the electric wiring that burned a hole in the main fuel line. The post-impact fire destroyed the normal category helicopter. There is a strong possibility that the proposed burn test requirements could

have prevented this accident. Benefits in terms of averted equipment damage and just one or two minor injuries from an accident involving a part 27 rotorcraft would easily exceed the incremental costs of this proposal. Codification of this requirement would ensure that all future designs comply, increasing the minimum level of safety.

Based on the findings of no significant incremental costs coupled with the benefits of harmonization savings and higher levels of safety, the FAA has determined that the proposed rule would be cost-beneficial.

Initial Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure that small entities are not unnecessarily and disproportionately burdened by government regulations. The RFA requires a Regulatory Flexibility Analysis if a proposed or final rule would have a significant economic impact, either detrimental or beneficial, on a substantial number of small entities. FAA Order 2100.14A, Regulatory Flexibility Criteria and Guidance, prescribes standards for complying with RFA requirements in FAA rulemaking actions. The Order defines "small entities" in terms of size, "significant economic impact" in terms of annualized costs, and "substantial number" as a number that is not less than 11 and which is more than one-third of the small entities subject to a proposed or final rule.

The proposed rule would affect manufacturers of future type-certificated normal and transport category rotorcraft. For aircraft manufacturers, Order 2100.14A defines a small entity as one with 75 or fewer employees and a significant economic impact as annualized costs of at least $19,500 (1995 dollars). The FAA has determined that the proposed rule would not have a significant economic impact on a substantial number of small manufacturers since (1) no part 29 and only two part 27 rotorcraft manufacturers have 75 or fewer employees, and (2) the annualized incremental costs of the rule are less than $19,500.

International Trade Impact Analysis

The proposed rule would not constitute a barrier to international trade, including the export of American rotorcraft to foreign countries and the import of foreign rotorcraft into the United States. Instead, the proposed changes on rotorcraft certification procedures, harmonized with those of the JAA, would lower dual certification costs, thereby enhancing free trade. Each applicant for a new type certificate for normal and transport category rotorcraft, whether the applicant be U.S. or foreign, will be required to show compliance with this rule.

Conclusion

For the reasons discussed above, including the findings in the Regulatory Flexibility Determination and the International Trade Impact Analysis, the Office of Information and Regulatory Affairs (OIRA) in conjunction with the FAA has determined that this proposed regulation is not a significant regulatory action under Executive Order 12866 and, therefore, is not subject to centralized regulatory review by the OIRA. In addition, the FAA certifies that this regulation will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. This proposal is considered to be nonsignificant under DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). An initial regulatory evaluation of the proposal, including a Regulatory Flexibility Determination and Trade Impact Analysis, has been placed in the docket. A copy may be obtained by contacting the person identified under "FOR FURTHER INFORMATION CONTACT."

List of Subjects

14 CFR Part 27

Air transportation, Aircraft, Aviation safety, Rotorcraft, Safety.

14 CFR Part 29

Air transportation, Aircraft, Aviation safety, Rotorcraft, Safety.

THE PROPOSED AMENDMENTS

In consideration of the foregoing, the FAA proposes to amend 14 CFR parts 27 and 29 as follows:

PART 27 AIRWORTHINESS STANDARDS: NORMAL CATEGORY ROTORCRAFT

1. The authority citation for part 27 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701-44702, 44704.

2. In § 27.625, a new paragraph (d) is added to read as follows:

§27.625 Fitting factors.

* * * * *

(d) Each seat, berth, litter, safety belt, and harness attachment to the structure must be shown by analysis, tests, or both, to be able to withstand the inertia forces prescribed in 27.561(b)(3) multiplied by a fitting factor of 1.33.

3. Section 27.785 is amended by revising the heading and by adding a new sentence to the end of paragraph (k)(2) to read as follows:

§ 27.785 Seats, berths, litters, safety belts, and harnesses.

* * * * *

(k) * * *

(2) * * * The fitting factor required by § 27.625(d) shall be applied.

4. Section 27.975(b) is revised to read as follows:

§ 27.975 Fuel tank vents.

* * * * *

(b) The venting system must be designed to minimize spillage of fuel through the vents to an ignition source in the event of a rollover during landing, ground operation, or a survivable impact.

5. In § 27.1329 , a new paragraph (f) is added to read as follows:

§27.1329 Automatic pilot system.

* * * * *

(f) If the automatic pilot system can be coupled to airborne navigation equipment, means must be provided to indicated to the pilots the current mode of operation. Selector switch position is not acceptable as a means of indication.

6. In § 27.1365, a new paragraph (c) is added to read as follows:

§27.1365 Electric cables.

* * * * *

(c) Insulation on electrical wire and cable installed in the rotorcraft must be self-extinguishing when tested in accordance with part 25, Appendix F, Part I(a)(3).

PART 29--AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY ROTORCRAFT

7. The authority citation for part 29 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701-44702, 44704.

8. In § 29.625, a new paragraph (d) is added to read as follows:

§ 29.625 Fitting factors.

* * * * *

(d) Each seat, berth, litter, safety belt and harness attachment to the structure must be shown by analysis, tests, or both, to be able to withstand the inertia forces prescribed in 29.561 (b)(3) multiplied by fitting factor of 1.33.

9. Section 29.785 is amended by revising the heading and by adding a new sentence to the end of paragraph (k)(2) to read as follows:

§ 29.785 Seats, berths, litters, safety belts, and harnesses

* * * * *

(k) * * *

(2) * * * The fitting factor required by § 29.625(d) shall be applied.

10. In § 29.923(a), the first sentence of the introductory text is revised to read as follows:

§ 29.923 Rotor drive system and control mechanism tests.

(a) Endurance tests, general. Each rotor drive system and rotor control mechanism must be tested, as prescribed in paragraphs (b) through (n) and (p) of this section, for at least 200 hours plus the time required to meet the requirements of paragraphs (b)(2), (b)(3), and (k) of this section. * * *

* * * * *

11. Section 29.975(a)(7) is revised to read as follows:

§ 29.975 Fuel tank vents and carburetor vapor vents.

(a) * * *

(7) The venting system must be designed to minimize spillage of fuel through the vents to an ignition source in the event of a rollover during landing, ground operations, or a survivable impact.

* * * * *

12. In § 29.1329, a new paragraph (f) is added to read as follows:

§ 29.1329 Automatic pilot system.

* * * * *

(f) If the automatic pilot system can be coupled to airborne navigation equipment, means must be provided to indicate to the pilots the current mode of operation. Selector switch position is not acceptable as a means of indication.

13. In § 29.1351, paragraph (d)(1)(iii) is removed.

§29.1351 General.

14. In § 29.1359, a new paragraph (c) is added to read as follows:

§ 29.1359 Electrical system fire and smoke protection.

* * * * *

c. Insulation on electrical wire and cable installed in the rotorcraft must be self-extinguishing when tested in accordance with part 25, Appendix F, Part I(a)(3).

Issued in Washington, DC, on

EXECUTIVE SUMMARY

TITLE: Harmonization of Miscellaneous Rotorcraft Regulations; Notice of Proposed Rulemaking (NPRM)

SUMMARY: This NPRM will amend the airworthiness standards to increase the regulatory safety level and standardize terminology. The changes would (1) require a cockpit indication of autopilot operating mode to the pilots for certain autopilot configurations, (2) clarify the burn test requirements for electrical wiring for transport category rotorcraft, (3) provide a new requirement for an electrical wire burn test for normal category rotorcraft, (4) add a 1.33 fitting factor structural strength requirement to the attachment to litters and berths, and (5) add miscellaneous wording changes to harmonize 14 CFR parts 27 and 29 (parts 27 and 29) and the Joint Aviation Requirements (JAR) 27 and 29.

BACKGROUND: On January 20, 1995, the FAA issued a Notice in the Federal Register announcing the establishment of the Harmonization of Miscellaneous Rotorcraft Regulations Working Group. The working group included representatives from four major rotorcraft manufacturers (normal and transport) and representatives from Aerospace Industries Association of America, Inc. (AIA), Association Europeene des Constructeurs de Material Aerospatial (AECMA), Helicopter Association International (HAI), Joint Aviation Authorities, and the FAA Rotorcraft Directorate.

The FAA tasked the Working Group to recommend to ARAC new or revised requirements for pilot indication of autopilot operating mode; burn test for electrical wire; seats, berths, and litters; and other rotorcraft issues that included the disharmonizations that occurred between parts 27 and 29 and JAR 27 and 29 in the published Rotorcraft 30 Second/2 Minute One-Engine Inoperative Power Ratings (49 FR 47764; September 16, 1994) and the Crash Resistant Fuel Systems (CRFS) in Normal and Transport Category Rotorcraft (59 FR 50380; October 3, 1994) final rules.

WHO WILL BE AFFECTED: Manufacturers, pilots, and occupants of normal and transport category rotorcraft.

COSTS AND BENEFITS: Overall, the proposed changes would result in net cost savings by promoting harmonization between FAA and JAA regulations and eliminating unnecessary duplication of certification requirements. Based on the findings of no significant incremental costs coupled with the benefits or harmonization savings and higher levels of safety, the FAA has determined that the proposed rule would be cost-beneficial

ENERGY IMPACT: The energy impact of the NPRM has been assessed in accordance with the Energy Policy and Conservation Act (EPCA), P.L. 94-163, and Interim Agency Guidelines. It has been determined that the NPRM is not a major regulatory action under the provisions of the EPCA.

ENVIRONMENTAL IMPACT: The environmental impact of the NPRM has been assessed in accordance with FAA Order 1050.1D, and it has been determined that the NPRM is not a major Federal action significantly affecting the environment.

Daniel P. Salvano
Manager, Rotorcraft Directorate
Aircraft Certification Service

U.S. Department
of Transportation

**FEDERAL AVIATION
ADMINISTRATION**
Washington, D.C. 20591

PRELIMINARY REGULATORY EVALUATION, INITIAL REGULATORY FLEXIBILITY DETERMINATION, AND TRADE IMPACT ASSESSMENT

FOR

NOTICE OF PROPOSED RULEMAKING:

HARMONIZATION OF MISCELLANEOUS ROTORCRAFT REGULATIONS

OFFICE OF AVIATION POLICY AND PLANS
AIRCRAFT REGULATORY ANALYSIS BRANCH, APO-320
Arnold J. Hoffman
April 1996

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Executive Summary

This regulatory evaluation examines the impacts of several proposed changes to parts 27 and 29 of the Federal Aviation Regulations (FAR). Part 27 prescribes airworthiness standards for type certification of normal category rotorcraft (maximum weight of 6,000 pounds) and part 29 prescribes corresponding standards for transport category rotorcraft. The proposed rule changes would: (1) require pilot indication of autopilot operating mode; (2) clarify the burn test requirements for electrical wire in transport category rotorcraft and provide similar requirements in normal category rotorcraft; (3) require that the 1.33 fitting factor for seats also apply to berths and litters; and (4) make miscellaneous wording changes based on standards adopted by the European Joint Aviation Authorities (JAA) for Joint Aviation Requirements (JAR) 27 and 29.

The proposed revisions would impose no incremental costs on manufacturers or operators of part 29 rotorcraft. For smaller manufacturers producing only part 27 rotorcraft, there would be incremental costs totaling between $40,000 and $70,000 (nondiscounted 1995 dollars) per type certification associated with one provision and $2,000 for another provision. Benefits of averted accidents and reduced certification costs associated with harmonized FAR/JAR requirements would easily exceed these costs.

The rule changes would not have a significant economic impact on small entities. In addition, they would not constitute a barrier to international trade, including the export of U.S. rotorcraft to foreign countries and the import of foreign rotorcraft into the United States. Instead, the changes would harmonize certification procedures of the Federal Aviation Administration (FAA) with those of the JAA and thereby lessen restraints on trade.

Regulatory Evaluation of Notice of Proposed Rulemaking (NPRM):

"Harmonization of Miscellaneous Rotorcraft Regulations"

I. Introduction

This Regulatory Evaluation examines the impacts of a Notice of Proposed Rulemaking (NPRM) that would change the type certification requirements for normal and transport category rotorcraft (Federal Aviation Regulations (FAR) parts 27 and 29) to: (1) require pilot indication of autopilot operating mode; (2) clarify the burn test requirements for electrical wire in transport category rotorcraft and provide similar requirements in normal category rotorcraft; (3) require that the 1.33 fitting factor for seats also apply to berths and litters; and (4) make miscellaneous wording changes based on standards adopted by the European Joint Aviation Authorities (JAA) for Joint Aviation Requirements (JAR) 27 and 29.

The changes would promote harmonization between Federal Aviation Administration (FAA) and JAA regulations. Harmonization would eliminate unnecessary duplication of certification requirements, thus reducing manufacturers' costs.

II. Background

The FAA established the Aviation Rulemaking Advisory Committee (ARAC) in February 1991 under the Federal Advisory Committee Act to provide

recommendations to the FAA on rulemaking related to aviation safety issues. The ARAC subsequently established the Rotorcraft Issues Group to deal with airworthiness standards for parts 27 and 29 rotorcraft. By a notice in the Federal Register (60 FR 4221, January 20, 1995), the FAA announced the establishment of the Harmonization of Miscellaneous Rotorcraft Regulations Working Group (WG) in the ARAC. The WG was tasked to recommend new or revised requirements for: pilot indication of autopilot operating mode; burn test for electrical wire; seats, berths, and litters; and other rotorcraft issues. The WG includes representatives from four major rotorcraft manufacturers and representatives from Aerospace Industries Association of America, Inc., Association Europeene des Constructeurs de Material Aerospatial, Helicopter Association International, JAA, and the FAA Rotorcraft Directorate. This broad participation is consistent with FAA policy to involve all known interested parties as early as practicable in the rulemaking process.

Specifically, the tasks assigned were as follows:

1. Review §§ 27.1329 and 29.1329, and supporting policy and guidance material to determine the course of action to be taken for rulemaking and/or policy relative to the issue of requiring pilot indication of autopilot operating mode similar to parts 23 and 25 requirements.

2. Review parts 27 and 29 to determine if clarification is needed for the burn test requirements for transport category rotorcraft and

whether a new requirement for burn test for electrical wire for normal category rotorcraft is needed. Consider whether § 29.1351(d)(3) should be deleted and if new §§ 27.1365(c) and 29.1359(c) should be created to specify electrical wire insulation burn test requirements.

3. Review §§ 27.785(f)(2) and 29.785(f)(2) to determine if these sections should be revised to specify whether the 1.33 fitting factor for seats should also apply to berths and litters.

4. Review and make recommendations regarding the disharmonizations introduced by the New Rotorcraft 30 Second/2 Minute One-Engine Inoperative Power Ratings (OEI) (59 FR 47764; September 16, 1994) and the Crash Resistant Fuel Systems (CRFS) in Normal and Transport Category Rotorcraft (59 FR 50380; October 3, 1994) final rules.

As a result of the WG's research and recommendations on these tasks, the ARAC recommended rulemaking to the FAA. The FAA concurs and proposes the revisions to FAR parts 27 and 29 contained in this NPRM.

III. Amendments and Associated Costs and Benefits

A. Parallel changes to parts 27 and 29

1. Fitting factors; Seats, safety belts, and harnesses (Sections 27.625(d)/27.785(k)(2) and 29.625(d)/29.785(k)(2))

The proposed revision to these sections would require that the 1.33 fitting factor[1] for seats also apply to berths and litters. The 1.33 fitting factor is required to ensure that fittings subject to wear and tear due to normal use and frequent removal and replacement in the aircraft will retain adequate strength, in the worn condition, to perform their intended function under crash landing conditions. The need for this factor for seats and harnesses is recognized in FAR parts 23, 25, 27 and 29 and in the corresponding JAR parts. The need for the 1.33 factor for litters, berths and harnesses is recognized in parts 23 and 25 and JAR 23 and 25, but is not currently included in parts 27 and 29 and JAR 27 and 29. The proposed changes would provide the same level of safety for passengers in seats, litters, and berths and would harmonize the FAR and the JAR.

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[1] A special factor of safety applied to each fitting (a part or terminal used to join one structural member to another). Certain factors of safety (applicable to external and inertia loads) must be multiplied by the highest pertinent special factor of safety (as prescribed in §§ 27.621-27.625 and 29.621-29.625) for each part of the structure whose strength is uncertain, likely to deteriorate in service before normal replacement, or subject to appreciable variability because of uncertainties in manufacturing processes or inspection methods.

This proposal would not impose incremental costs on most rotorcraft manufacturers. One small manufacturer of part 27 rotorcraft indicated additional nonrecurring testing and analysis costs of $2,000 to substantiate the 1.33 factor in an initial new type certification; most likely, this additional cost would not be incurred in subsequent type certifications.

Although there have been no identifiable accidents involving litters attributable to insufficient attachment strength, even one minor injury would far exceed the relatively low costs. Codification of the 1.33 fitting factor (inherent in most current designs) would ensure that all future designs include this standard, increasing the minimum level of safety.

2. Fuel tank vents and carburetor vapor vents (Sections 27.975 and 29.975)

The proposed revision to these sections would resolve a difference between FAR parts 27/29 and JAR 27/29 introduced by the CRFS final rule. The phrase "unless a rollover is shown to be extremely remote" in §§ 27.975(b) and 29.975(a)(7)[2] would be removed. The JAA suggests that the phrase results in weakening the intent of the requirement, which is to minimize the chances of a post-crash fire in the **event** of a rollover irrespective of the **likelihood** of a rollover occurring. There would be

[2] These provisions (both relating to fuel tank vents) require that "the venting system must be designed to minimize spillage of fuel through the vents to an ignition source in the event of a rollover during landing, ground operation or a survivable impact, unless a rollover is shown to be extremely remote."

no incremental costs or benefits associated with this change since rotorcraft currently meet the minimum fuel spillage requirements of this section.

3. Automatic pilot system (Sections 27.1329 and 29.1329)

A new paragraph (f) would be added to §§ 27.1329 and 29.1329 to require that autopilot operating mode be displayed to the crew. Current §§ 23.1329(h) and 25.1329(h) require that "If the automatic pilot system can be coupled to airborne navigation equipment, means must be provided to indicate to the flight crew the current mode of operation. Selector switch position is not acceptable as a means of indication."

Airplane accidents have occurred due to the crew not being aware of the autopilot mode. A potential safety problem could be avoided by requiring that the autopilot mode be displayed to rotorcraft crews also (autopilot systems are relatively rare in rotorcraft). The proposal, which would harmonize parts 23, 25, 27 and 29 with the corresponding JAR, would not impose any incremental costs on rotorcraft manufacturers since new autopilot systems employed in rotorcraft are identical to those in airplanes and the mode indicator is now integral to such systems. Codification of this requirement would ensure that all future rotorcraft designs comply with this standard.

B. Separate changes to part 27 or part 29

1. Electric cables (Section 27.1365)

Section 27.1365(c) is proposed since part 27 does not contain burn test requirements for electrical wire. Most European and U.S. manufacturers currently use electrical wire that meets the burn test requirements for transport category rotorcraft since they produce both parts 27 and 29 rotorcraft. However, the few manufacturers that produce normal category rotorcraft only would likely experience additional costs. One manufacturer estimates additional nonrecurring testing/design costs at $5,000 per type certification and additional wiring costs of $500 per rotorcraft. At an estimated production of seven rotorcraft per year, the incremental recurring costs would total $3,500 per year for ten years, or $35,000 total (nondiscounted 1995 dollars), under one type certification. Another manufacturer estimates additional wiring costs of approximately $350 per rotorcraft and no additional nonrecurring costs. At an estimated production of 20 rotorcraft per year, the incremental recurring costs would total $7,000 per year for ten years, or $70,000 total (nondiscounted 1995 dollars), under one type certification.

There have been several accidents (and more numerous Service Difficulty Reports) related directly or indirectly to shorted or burned-through electrical wiring, i.e., the insulation offered insufficient protection. Examination of National Transportation Safety Board accident and incident data for the period 1983 through 1995 indicates one accident

(in June, 1994) primarily caused by an electrical short in the electric wiring which burned a hole in the main fuel line. The post-impact fire destroyed the helicopter (part 27). There is a strong possibility that the proposed burn test requirements could have prevented this accident. Benefits in terms of averted equipment damage and just one or two minor injuries from an accident involving a part 27 rotorcraft would easily exceed the incremental costs (maximum $70,000 per type certification) of this proposal. Codification of this requirement would ensure that all future designs include it, increasing the minimum level of safety.

[The following revisions involve minor clarifications or administrative changes]

2. Rotor drive system ... (Section 29.923)

Proposed § 29.923(a) would be amended by adding the text, "and (p)," after paragraphs (b) through (n). This would be an administrative change and would resolve a difference between the FAR and JAR regarding the OEI final rule.

3. Electrical systems and equipment - General (Section 29.1351)

The proposal would remove § 29.1351(d)(3) which refers to the burn test requirements in § 25.1359(d) that was removed by Amendment 25-72 (55 FR 29756; July 20, 1990), and add them to new § 29.1359(c). The change is administrative and would not alter the current requirements.

4. Electrical system fire and smoke protection (Section 29.1359(c))

As discussed in the previous paragraph, new § 29.1359(c) would contain the burn test requirements, which would be an administrative change not altering the current requirements.

C. Costs/Benefits summary

In summary, the proposed revisions would impose no incremental costs on manufacturers or operators of part 29 rotorcraft. For smaller manufacturers producing only part 27 rotorcraft, there would be incremental costs totaling between $40,000 and $70,000 (nondiscounted 1995 dollars) per type certification associated with one provision and $2,000 for another provision. Benefits of averted accidents and reduced certification costs associated with harmonized FAR/JAR requirements would easily exceed these costs. In addition, codification of those requirements complied with indirectly (i.e., as a result of complying with other provisions) or "voluntarily" (by virtue of competitive pressures) would ensure continuation of enhanced safety levels in future rotorcraft designs.

Based on the findings of no significant incremental costs coupled with the benefits of harmonization savings and higher levels of safety, the FAA has determined that the proposed rule would be cost-beneficial.

IV. Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure that small entities are not unnecessarily and disproportionately burdened by government regulations. The RFA requires a Regulatory Flexibility Analysis if a proposed or final rule would have a significant economic impact, either detrimental or beneficial, on a substantial number of small entities. FAA Order 2100.14A, Regulatory Flexibility Criteria and Guidance, prescribes standards for complying with RFA requirements in FAA rulemaking actions. The Order defines "small entities" in terms of size, "significant economic impact" in terms of annualized costs, and "substantial number" as a number which is not less than eleven and which is more than one-third of the small entities subject to a proposed or final rule.

The proposed rule would affect manufacturers of future type-certificated normal and transport category rotorcraft. For aircraft manufacturers, Order 2100.14A defines a small entity as one with 75 or fewer employees and a significant economic impact as annualized costs of at least $19,500 (1995 dollars). The FAA has determined that the proposed rule would not have a significant economic impact on a substantial number of small manufacturers since (1) no part 29 and only two part 27 rotorcraft manufacturers have 75 or fewer employees, and (2) the annualized incremental costs of the rule are less than $19,500.

V. International Trade Impact Assessment

The proposed rule would not constitute a barrier to international trade, including the export of U.S. rotorcraft to foreign countries and the import of foreign rotorcraft into the United States. Instead, the changes would harmonize certification procedures of the FAA with those of the JAA and thereby lessen restraints on trade.

For Insertion Into Preamble of Proposed Rule:

"Harmonization of Miscellaneous Rotorcraft Regulations"

Economic Evaluation, Regulatory Flexibility Determination, and International Trade Impact Assessment

Proposed changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 directs that each Federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980 requires agencies to analyze the economic impact of regulatory changes on small entities. Third, the Office of Management and Budget directs agencies to assess the effects of regulatory changes on international trade. In conducting these analyses, the FAA has determined that this proposed rule: 1) would generate benefits that justify its costs and is not a "significant regulatory action" as defined in the Executive Order; 2) is not "significant" as defined in DOT's Regulatory Policies and Procedures; 3) would not have a significant impact on a substantial number of small entities; and 4) would lessen restraints on international trade. These analyses, available in the docket, are summarized below.

Economic Evaluation

Overall, the proposed changes would result in net cost savings by promoting harmonization between FAA and JAA regulations and eliminating unnecessary duplication of certification requirements. The costs and

benefits of the changes regarding the fitting factor for berths and litters, removal of the phrase "unless a rollover is shown to be extremely remote" (in §§ 27.975(b) and 29.975(a)(7)), autopilot operating mode, and burn test for electrical wire in normal category rotorcraft, are summarized below. All other revisions involve clarifications or administrative changes.

The fitting factor requirement would not impose incremental costs on most rotorcraft manufacturers. One small manufacturer of part 27 rotorcraft indicated additional nonrecurring testing and analysis costs of $2,000 to substantiate the 1.33 factor in an initial new type certification; most likely, this additional cost would not be incurred in subsequent type certifications. Although there have been no identifiable accidents involving litters attributable to insufficient attachment strength, even one minor injury would far exceed the relatively low costs. Codification of the 1.33 fitting factor, which is inherent in most current designs, would ensure that all future designs include this standard, increasing the minimum level of safety.

There would be no incremental costs or benefits associated with removal of the phrase "unless a rollover is shown to be extremely remote" in §§ 27.975(b) and 29.975(a)(7) since rotorcraft currently meet the minimum fuel spillage requirements of these sections.

The autopilot display requirement would not impose any incremental costs on rotorcraft manufacturers since new autopilot systems employed in rotorcraft are identical to those in airplanes and the mode indicator is

now integral to such systems. Codification of this requirement would ensure that all future rotorcraft designs comply with this standard.

Most U.S. and European manufacturers currently use electrical wire that meets the burn test requirements for transport category rotorcraft since they produce both parts 27 and 29 rotorcraft. However, the few manufacturers that produce normal category rotorcraft only would likely experience additional costs. One manufacturer estimates additional nonrecurring testing/design costs at $5,000 per type certification and additional wiring costs of $500 per rotorcraft. At an estimated production of seven rotorcraft per year, the incremental recurring costs would total $3,500 per year for ten years, or $35,000 total (nondiscounted 1995 dollars), under one type certification. Another manufacturer estimates additional wiring costs of approximately $350 per rotorcraft and no additional nonrecurring costs. At an estimated production of 20 rotorcraft per year, the incremental recurring costs would total $7,000 per year for ten years, or $70,000 total (nondiscounted 1995 dollars), under one type certification.

There have been several accidents (and more numerous Service Difficulty Reports) related directly or indirectly to shorted or burned-through electrical wiring, i.e., the insulation offered insufficient protection. Examination of National Transportation Safety Board accident and incident data for the period 1983 through 1995 indicates one accident (in June, 1994) primarily caused by an electrical short in the electric wiring which burned a hole in the main fuel line. The post-impact fire destroyed the helicopter (part 27). There is a strong possibility that

the proposed burn test requirements could have prevented this accident. Benefits in terms of averted equipment damage and just one or two minor injuries from an accident involving a part 27 rotorcraft would easily exceed the incremental costs of this proposal. Codification of this requirement would ensure that all future designs include it, increasing the minimum level of safety.

Based on the findings of no significant incremental costs coupled with the benefits of harmonization savings and higher levels of safety, the FAA has determined that the proposed rule would be cost-beneficial.

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure that small entities are not unnecessarily and disproportionately burdened by government regulations. The RFA requires a Regulatory Flexibility Analysis if a proposed or final rule would have a significant economic impact, either detrimental or beneficial, on a substantial number of small entities. FAA Order 2100.14A, Regulatory Flexibility Criteria and Guidance, prescribes standards for complying with RFA requirements in FAA rulemaking actions. The Order defines "small entities" in terms of size, "significant economic impact" in terms of annualized costs, and "substantial number" as a number which is not less than eleven and which is more than one-third of the small entities subject to a proposed or final rule.

The proposed rule would affect manufacturers of future type-certificated normal and transport category rotorcraft. For aircraft manufacturers, Order 2100.14A defines a small entity as one with 75 or fewer employees and a significant economic impact as annualized costs of at least $19,500 (1995 dollars). The FAA has determined that the proposed rule would not have a significant economic impact on a substantial number of small manufacturers since (1) no part 29 and only two part 27 rotorcraft manufacturers have 75 or fewer employees, and (2) the annualized incremental costs of the rule are less than $19,500.

International Trade Impact Assessment

The proposed rule would not constitute a barrier to international trade, including the export of U.S. rotorcraft to foreign countries and the import of foreign rotorcraft into the United States. Instead, the changes would harmonize certification procedures of the FAA with those of the JAA and thereby lessen restraints on trade.